

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF VIRGINIA
RICHMOND DIVISION

UNITED STATES OF AMERICA,
Plaintiff,

v.

RAYNARD COUNCIL,
Defendant.

Action No. 3:10-CR-81

MEMORANDUM OPINION

This matter comes before the Court on Council's Motion *in Limine*. Council challenges the reliability of (1) the Government's proposed palm print expert and (2) the Government's proposed patrol canine handler.

I.

Council is charged with possession of a firearm by a convicted felon. On the night of January 26, 2010, officers pursued a fleeing Council in Richmond's Battery Park. The officers eventually caught Council and arrested him. Before the officers arrested Council, an air unit of the Richmond police visually following Council reported to ground officers that it saw Council make a movement consistent with throwing an object into a hedge row. Several police units—including Officer Jason Morrison and his patrol canine, King—began combing Battery Park in search of the object Council purportedly tossed in the shrubs. After roughly ninety minutes of searching, King dove into the hedges while running in the area where police pursued Council. Morrison shined his flashlight toward the hedge where King dove and saw the butt of a handgun. Officer Morrison secured the area around the gun until a detective removed it.

The Government intended to argue at trial that known palm prints collected from Council matched a latent palm print collected from the firearm.¹ In support the United States planned to offer the testimony of Sarah Dwyer, a forensic scientist and latent print examiner with the Virginia Department of Forensic Science (VDFS). Council moved to exclude Dwyer's testimony. Citing a 2009 National Research Council report ("NRC report") casting doubt on the methodological underpinnings of print examination, Council urged the Court to exclude Dwyer's testimony pursuant to Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).²

The Court held a hearing on February 1, 2011, to entertain Council's motion. The Court first heard Dwyer's testimony. Between November 2005 and August 2006, Dwyer participated in the Virginia Institute of Forensic Science and Medicine's (VIFSM) Latent Print Fellowship, a rigorous ten-month postgraduate fellowship providing education in basic principles, history, physiology of print examination. Since completing that program, Dwyer has worked as a latent fingerprint examiner for VDFS. Dwyer is also a member of the Chesapeake Bay Division of the International Association for Identification (IAI), an organization that provides continuing education to print examiners, though she has not been certified by the IAI. By her recollection, Dwyer has been qualified as a fingerprint expert in state or federal court on at least seven occasions.

The Court also heard testimony from Janine Childress-Sodano, another forensic scientist and latent print examiner with VDFS. Childress-Sodano has worked as a print examiner with VDFS for roughly seven years. Like Dwyer, Childress-Sodano completed the VIFSM's Latent

¹ "Latent" fingerprints or palm prints are "partial prints like those found at crime scenes and often are invisible to the naked eye." *United States v. Baines*, 573 F.3d 979, 982 (10th Cir. 2009). In contrast, a "known" print is made intentionally when police arrest an individual. *Id.*

² National Research Council, Committee on Identifying the Needs of the Forensic Sciences Community, *Strengthening Forensic Science in the United States: A Path Forward* (2009) (hereinafter NRC Report).

Print Fellowship. Childress-Sodano is certified by the IAI and is a member of the Chesapeake Bay Division of the IAI. In order to gain IAI certification, Childress-Sodano completed a written examination, performed a pattern recognition test, and performed at least twelve print comparisons. She has qualified as a print expert in Virginia state and federal courts roughly twenty times.

Dwyer and Childress-Sodano, along with other examiners employed by VDFS, adhere to examination standards promoted by the Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST). Pursuant to the recommendation of SWGFAST, VDFS examiners apply the ACE-V method of print examination. As the dominant mode of print examination, or “friction ridge analysis,” ACE-V presumes that no two individuals possess the exact same fingerprints. Hence, an examiner undertaking ACE-V operates under the related premises that two prints must belong to the same person if a latent and known print match, and two prints must belong to different persons if a latent and known print do not match.

ACE-V consists of four steps. At the analysis stage, the examiner makes a detailed assessment of the print’s friction ridges in order to determine the latent print’s value. She determines whether the print is sufficiently clear, or too distorted, to allow identification of distinguishing points and characteristics on the print. If the print is sufficiently clear, the examiner finds and records the quality and quantity of various points and characteristics identified on the print at three separate levels of specificity. At the first level, where an examiner may exclude but not confirm a match, the examiner assesses the flow, or the direction, of the ridges. At the second, the examiner searches out and documents characteristics of individual ridges. And at the third, the examiner charts the placement of pores throughout the ridges.

As Dwyer explained, an examiner typically gains a firm identification of the print’s unique

characteristics at the second level of specificity. There, an examiner identifies three types of individualizing characteristics: dots, ending ridges, and bifurcations. According to Dwyer, neither SWGFAST, nor the VDFS, nor the IAI require an examiner to identify any particular number of identifying characteristics in order to determine a match between a latent and known print. Rather, the requisite number of identifying characteristics varies depending on the quality of the characteristics found on the latent print.

Next, at the comparison stage, the examiner determines whether the friction ridge characteristics present on the latent print exist on the known print. Having recorded the characteristics visible from at least the first two levels of specificity, the examiner studies the known print to determine whether both prints demonstrate the same characteristics.

At the evaluation stage, the examiner formulates her conclusion. She judges the significance of all the characteristics in agreement or disagreement between the latent and known prints. She will conclude the prints match if enough similarities between the latent and known prints exist to make it impossible that another print would exhibit the same characteristics. She will conclude the prints do not match if they contain at least one major, unexplainable difference. For example, a difference resulting from an overlap between two prints an individual left close to one another can be explained and therefore will not lead an examiner to exclude the latent print as a match. In contrast, a difference resulting from the presence of a characteristic present on the latent print, but absent from the known print, is not explainable and is therefore a basis for exclusion. Finally, at the verification stage, a second examiner conducts an independent examination of the latent print using the first three stages of the ACE-V method. *See United States v. Baines*, 573 F.3d 979, 983 (10th Cir. 2009); *United States v. Aman*, No. 1:10cr236, 2010 WL 4103157, at *7 (E.D. Va. Oct. 18, 2010).

As Council pointed out, *Daubert* charges the Court with determining whether the experts in this case, rather than print experts generally, undertook reliable methods in conducting their inquiries into the match between the latent print and Council's known print. *See Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 153-54 (1999). To that end, the Government made a thorough showing of the examiners' application of ACE-V to the latent palm prints recovered by agents on the night of Council's arrest. Dwyer determined a palm print recovered from the handgun was valuable for individualization, because she rated the print's quality "average to good" for examination purposes. (Hr'g Tr. 28.) Notably, Dwyer observed that the print exhibited so many identifying characteristics that she did not need to count all of them in order to establish a usable profile. Dwyer plotted characteristics from the first and second levels of specificity, though she noted several details from the third level of specificity available from the latent print. Dwyer ultimately plotted fourteen distinguishing characteristics she would compare to Council's known print. After comparing those characteristics to the known print, she found no unexplainable differences between the prints. Using reproductions of the latent and known prints, Dwyer called the Court's attention to several points in common between them. The only differences Dwyer found were explainable, relating, for example, to the different levels of pressure applied by the individual who made the prints.

After Dwyer performed her examination, Childress-Sodano undertook a blind verification of Dwyer's analysis. During the verification process, Dwyer and Childress-Sodano did not confer with one another regarding the examinations. Childress-Sodano was not told that the latent print originated from a handgun, and she was unaware of the previous examiner's conclusion. When Childress-Sodano received the materials Dwyer used for her analysis, she examined all aspects of the latent print and concluded the print was valuable for individualization.

She identified between seventeen and twenty distinguishing characteristics in the latent print given to her. She concluded that Council's known print shared each of these characteristics.

Council raised what he considered several problems with the manner in which Dwyer conducted her analysis. He questioned whether Dwyer might have underestimated the distorting effects, and the resulting reduction in the quality of the comparison, flowing from the differences in the amounts of pressure applied by the maker's hand for each print. He pointed out that the VDFS procedures guiding Dwyer's examination did not specify the number of points the examiner must observe before concluding that the latent print was valuable for individualization. Council further suggested VDFS procedures insufficiently guided Dwyer by failing to systematically walk her through the process of performing the side-by-side comparison between the latent and known prints. He cast doubt on Dwyer's claim that ACE-V is likely invulnerable to methodological error, even though Dwyer conceded that an individual practitioner might incorrectly apply ACE-V and reach an unreliable conclusion.

Council also offered the testimony of Dr. Jennifer Leigh Mnookin, a professor of law at the UCLA School of Law. Dr. Mnookin holds a law degree from Yale University and a Ph.D. in History and Social Study of Science and Technology from the Massachusetts Institute of Technology. Her research focuses on scientific evidence, particularly forensic science evidence and the validation of the scientific processes underlying forensic science evidence. She is currently a member of a working group of the National Institute of Justice and the National Institute of Standards and Technology that studies the effect of human factors on friction ridge analysis. The NRC report central to Council's motion relies in part on Dr. Mnookin's research questioning the processes underlying fingerprint analysis. By her own admission, Dr. Mnookin is

not qualified as a fingerprint examiner; rather, her expertise lies in the scientific foundations of print analysis. Dr. Mnookin's testimony was her first as a qualified expert.

Dr. Mnookin questioned the validity of ACE-V as a scientific method. In her view, ACE-V does not describe a scientific process but rather helps examiners engage in "careful looking." (Hr'g Tr. 107.) Dr. Mnookin argued the stages of ACE-V lack content for making difficult judgments within each stage. For example, Dr. Mnookin argued ACE-V lacks objective criteria to determine whether a print is fit for analysis and comparison and, therefore, relies almost entirely on the experience and intuition of the examiner. Additionally, at the analysis stage, ACE-V tells the examiner to determine whether a particular print is fit for comparison, but ACE-V does not explain how to make that determination, or how many characteristics suffice to allow the examiner to make that judgment. Dr. Mnookin also contended that no studies have shown that ACE-V is consistently successful or demonstrated its error rate. Dr. Mnookin's criticisms of ACE-V's scientific validity track the conclusions offered by the NRC report.³

II.

Federal Rule of Evidence 702 permits a qualified expert to opine on any technical or scientific matter that will help the jury understand evidence or determine a fact in issue. When a party offers expert testimony, the Supreme Court charges the trial court with deciding whether the expert's testimony is relevant and reliable. *Daubert*, 509 U.S. at 589. A court must conclude the expert witness "employs in the courtroom the same level of intellectual rigor that characterizes the

³ According to the NRC report, fingerprint examination is not supported by "peer-reviewed, published studies establishing [its] scientific bases and validity" and lacks "rigorous protocols to guide . . . [experts'] subjective assessments of matching characteristics." NRC Report 8. Additionally, the field lacks professional standards, making it difficult to "determine with adequate reliability that the finger that left an imperfect impression at a crime scene is the same finger that left an impression (with different imperfections) in a file of fingerprints." *Id.* at 43. Finally, the NRC report dismisses the assertion from some examiners that friction ridge analysis is not subject to possible error. *Id.* at 142.

practice of an expert in the relevant field.” *Kumho Tire*, 526 U.S. at 152. A trial court must limit its consideration “solely [to] principles and methodology,” and should not consider “the conclusions they generate.” *Daubert*, 509 U.S. at 594-95.

The Supreme Court has announced five factors courts can use in assessing an expert’s reliability: (1) whether the underlying technique can or has been tested; (2) whether the technique has been subjected to peer review and publication; (3) the known or potential rate of error; (4) the existence and maintenance of standards governing the technique’s operation; and (5) whether the technique is generally accepted in the relevant expert community. *Id.* at 593-94. The Court strongly emphasizes, however, that *Daubert*’s list of factors “was meant to be helpful, not definitive,” such that the factors “do not all necessarily apply even in every instance in which the reliability of scientific testimony is challenged.” *Kumho Tire*, 526 U.S. at 151. Where a court admits expert testimony in spite of a defendant’s concerns, “vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof” remain the defendant’s best tools for challenging the testimony. *Daubert*, 509 U.S. at 596.

The Fourth Circuit previously held that *Daubert* does not require the wholesale exclusion of fingerprint expert testimony in *United States v. Crisp*. 324 F.3d 261, 269 (4th Cir. 2003). In upholding the district court’s admission of the fingerprint expert, the panel explained that the field of friction ridge analysis recognizes “standards controlling the technique’s operation.” *Id.* at 269 (citing *Daubert*, 509 U.S. at 593-94). Government agencies, the panel pointed out, hold fingerprint examiners to a consistent “points and characteristics” approach to print analysis and require analysts to achieve “testing and proficiency requirements.” *Id.* at 269. The panel also relied heavily on the traditional judicial acceptance of fingerprint analysis. *Id.* at 268. After considering three arguments from the appellant similar to those Council raises here, the panel

concluded that the appellant had given it “no reason . . . to believe” that the general acceptance of print examination was unfounded. *Id.* at 269.

III.

The Court’s inquiry into the reliability of Dwyer’s method is “tied to the facts of [this] case.” *Daubert*, 509 U.S. at 591 (quoting *United States v. Downing*, 753 F.2d 1224, 1242 (3d Cir. 1985)). The Court has analyzed Dwyer’s method in light of *Daubert*’s recommended considerations and concludes it is sufficiently reliable to permit a jury to hear testimony on it.

The technique both Dwyer and Childress-Sodano used to examine the latent print is widely accepted in the relevant scientific community. To say ACE-V is generally accepted among friction ridge examiners is an understatement. But even widening the circle to include commentators such as Dr. Mnookin and the members of the committee that drafted the NRC report barely changes the balance of opinion. Adding those commentators to the equation does not outweigh the acceptance friction ridge analysis has gained from numerous forensic experts and law enforcement officials across the country. *See Crisp*, 324 F.3d at 269 (holding a district court was “within its discretion in accepting at face value the consensus of expert and judicial communities that the fingerprint identification technique is reliable”).

Friction ridge experts maintain widely recognized standards, and Dwyer applied those standards to the prints at issue in this case. Clearly, the existence, application, and widespread acceptance of ACE-V satisfies the Supreme Court’s concern about an expert’s use of ad hoc procedures unknown to, and therefore untestable by, other experts in the relevant field. *See Kumho Tire*, 526 U.S. at 154. For example, SWGFAST, an organization “composed of fingerprint specialists from numerous local, state, and federal law enforcement agencies,” has long

advocated the use of ACE-V. *Aman*, 2010 WL 4103157, at *9. Friction ridge examiners agree on the types of characteristics relevant to distinguishing one print from all others, including bifurcations, ending ridges, and ridge dots.⁴ A fundamental tenant of ACE-V is that, if a latent and a known print do not share one such characteristic at the identical location in the target area, then the examiner should unequivocally exclude the latent print as a match.

Council's objections are not so substantial to render Dwyer's testimony inadmissible. His concerns about the emphasis he believes ACE-V places on the examiner's subjective judgment are overstated. It goes too far to argue that no objective standards dictated Dwyer's examination. To be sure, there is reason to seek out objective criteria in a field that relies heavily on examiners' trained observations. And ACE-V may allow for some marginal discretion on the part of the examiner, as is the case with all scientific or technical inquiry.⁵ However, Dwyer's subjective judgments were cordoned off by objective standards shared by virtually the entire community of friction ridge analysts. *See Crisp*, 324 F.3d at 269. The community of friction ridge analysts applying ACE-V agrees on the characteristics relevant to a particular print's profile. Dwyer adhered to these widely accepted standards. Describing the process she undertook as "careful looking" unfairly suggests that a layperson not subject to those standards could effectively perform the same task. (Hr'g Tr. 107.)

Council's objections regarding the standards governing Dwyer's examination are also overblown considering the level of inquiry *Daubert* requires of the Court. *Daubert* requires the Court to ensure that Dwyer's examination was reliable. *See* 509 U.S. at 589. *Daubert* does not, however, demand of expert testimony "such an extremely high degree of intellectual purity" that

⁴ *Glossary*, SWGFAST (May 8, 2009), http://www.swgfast.org/documents/glossary/090508_Glossary_2.0.pdf.

⁵ For example, DNA profiling is considered the paragon of forensic inquiry. However, DNA profiling is not a mathematical exercise but rather involves a great deal of discretion and judgment. *See* Erin Murphy, *The Art in the Science of DNA: A Layperson's Guide to the Subjectivity Inherent in Forensic DNA Typing*, 58 Emory L.J. 489 (2008).

an underlying procedure must be “truly scientific in an intellectual, abstract sense” in order to be admitted. *Baines*, 573 F.3d at 989. Against this backdrop of controlling law, the Court is comfortable that Dwyer followed the standards that direct most other friction ridge analysts in the field. Hence, Council’s remaining objections about standards governing Dwyer’s examination go to the weight of Dwyer’s testimony, rather than its admissibility.

Additionally, Dwyer was sufficiently accountable to another expert in her examination to convince the Court of the examination’s reliability. Among the factors the Supreme Court directs courts to consider under *Daubert* is whether an expert’s method has been peer reviewed. *See Daubert*, 509 U.S. at 593-94. As Dr. Mnookin explained, blind verification is not the same thing as peer review, which entails an expert analyzing another expert’s method instead of an expert performing another expert’s analysis on his own. Nonetheless, both blind verification and peer review aim to achieve independent, unvarnished oversight of an initial practitioner’s analysis. Dwyer’s examination of the latent print in this case did not occur in a vacuum. The VDFS instituted the policy of blind verification in 2008, well before the National Research Council recommended forensic labs adopt the practice. In this case, Childress-Sodano verified Dwyer’s examination of the latent and known prints. She performed her own examination unaware of the latent print’s source and Dwyer’s conclusion, and came to a conclusion identical to Dwyer’s. That Childress-Sodano undertook a procedure identical to the one Dwyer performed and reached an identical conclusion confirms for the Court the reliability of Dwyer’s testimony.

This is not to say Dr. Mnookin and the NRC report have not usefully pointed out areas in which standards governing friction ridge analysis should continue to develop. These critiques, however, are insufficiently penetrating to warrant the exclusion of Dwyer’s testimony. For example, Dr. Mnookin pointed out that friction ridge analysis has not produced a generally

accepted error rate. But Dwyer and Childress-Sodano stated for the Court that friction ridge analysis was susceptible to some error rate, since it is possible for a human examiner to misapply ACE-V. For her part, Dr. Mnookin confirmed the Government's assertion that harsh critics of friction ridge analysis suggest an error rate of three percent, a figure within the boundary of acceptability for purposes of admission under Rule 702. These and other objections from Council go to the weight of Dwyer's testimony and not its admissibility.

As for the testing that supports Dwyer's method, the Government admitted that this factor was least helpful in establishing the reliability of Dwyer's testimony under Rule 702. Indeed, both Childress-Sodano and Dr. Mnookin recognized the need for more testing to determine the reliability of friction ridge analysis. Other courts have recognized that friction ridge analysis has "not attained the status of scientific law." *Crisp*, 324 F.3d at 268. See *Baines*, 573 F.3d at 990; *Aman*, 2010 WL 4103157, at *7-9.

That being said, one of those courts has noted that the prominence of friction ridge analysis in one hundred years of criminal prosecutions has, in a sense, tested the method. As the Tenth Circuit has explained, friction ridge analysis "has been subject to testing . . . in the world of criminal investigation, court proceedings, and other practical applications, such as identification of victims of disasters." *Baines*, 573 F.3d at 990. Friction ridge analysis is subject to testing every time an examiner excludes the owner of a known print as the owner of a latent print, a result that in turn prevents an innocent individual from standing trial for a crime he did not commit. The Court would effectively disallow this manner of testing if it awarded Council the relief he seeks.

IV.

Council also sought to exclude the testimony of Officer Jason Morrison, a patrol canine handler for the Henrico County Police Department. For roughly two years, Morrison has been certified as a canine dog handler through the Virginia State Police. During that time, he has worked with King, who is certified as a patrol canine through the Virginia State Police. King is trained to track suspects by alerting to a ground disturbance or body odor, the latter of which an individual omits by shedding skin cells. Morrison and King undergo a yearly recertification process with the Virginia Police Work Dog Association. On the night of Council's arrest, King alerted to the presence of a human scent or the odor of smokeless powder in a Battery Park hedgerow. King followed the scent into the hedgerow, where Morrison discovered the handgun.

Initially, Council urged the Court to scrutinize Morrison's testimony under *Daubert*. According to Council, the technical foundation underlying Morrison's claim that King alerted to the scent of human skin cells or smokeless powder was insufficiently reliable to allow a jury to hear it. At oral argument, Council shifted the basis for his motion *in limine* and argued that any reference to King would be irrelevant. *See* Fed. R. Evid. 403. Since Morrison would testify that King likely alerted to the odor of smokeless powder, his testimony regarding King's training in alerting to human scent would, in Council's view, confuse the jury and lead it to believe that King had alerted to Council himself.

The Court disagrees with Council and finds Morrison's testimony relevant. It is unclear to the Court how testimony describing how a patrol canine discovered a handgun in a set of bushes is particularly problematic for Council. The testimony is clearly relevant, even if not strongly probative of a material fact at issue, because King was plainly involved in discovering the handgun. Additionally, Morrison's testimony will not prejudice Council. If Morrison proposed

to testify that King certainly alerted to human scent without a proper foundation for such a claim, then the Court might exclude that testimony. The United States, however, does not propose that Morrison so testify. Rather, Morrison's testimony in front of the Court made it clear he would testify that King alerted either to the odor of human skin cells or smokeless powder. Morrison further provided support for the possibility that either of those may have triggered King's response.

V.

The Court has thoroughly considered Council's motions to exclude the testimonies of Dwyer and Morrison. For the reasons stated above, the Court denies the motions.

Let the Clerk send a copy of this Opinion to all counsel of record.

It is SO ORDERED.

<p style="text-align: center;">_____/s/_____ James R. Spencer Chief United States District Judge</p>

ENTERED this 4th day of April 2011